



National Aeronautics and  
Space Administration

# NASA earth

**Tom Wagner**

Associate Director, Earth Action

Earth Science Division

Science Mission Directorate

May 7, 2024



# Connecting to you



User-Centered



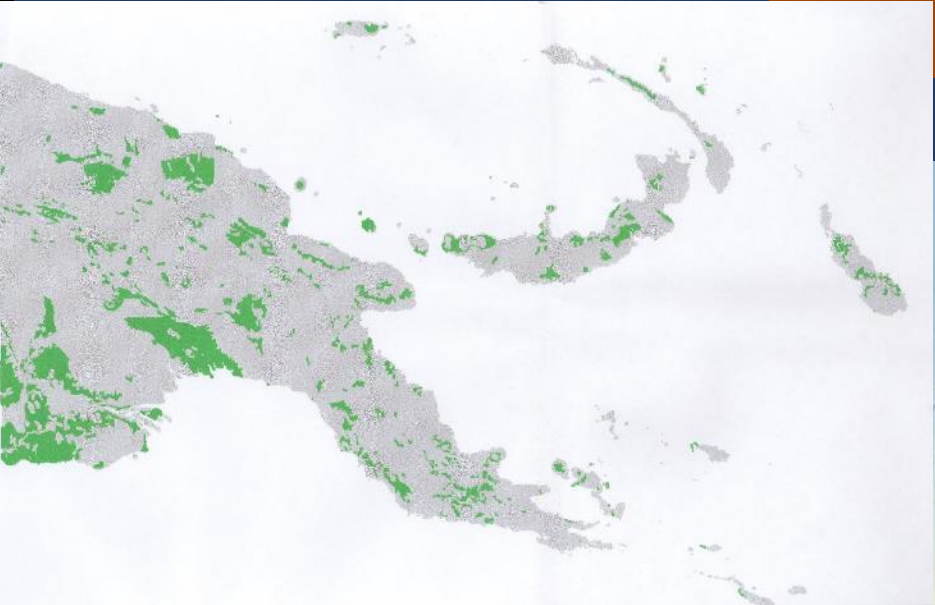
Building Bridges



Scaling

# ICESat-2

ICE, CLOUD, AND LAND ELEVATION SATELLITE-2



From tiny awards to big projects

DAVINCI 2029

VERITAS 203?

Decade of Venus!

ESA ENVISION 2032

A graphic illustration of a satellite with solar panels orbiting a golden planet. The satellite is labeled "VERITAS 203?". The planet is labeled "DAVINCI 2029". The text "Decade of Venus!" is prominently displayed in yellow. At the bottom right, "ESA ENVISION 2032" is written in yellow.

**My guiding principle**

**A deep & abiding  
respect for our  
investigators & project  
staff and your ideas.**

75% of our formal interactions are giving  
bad news and every day at work we get  
told our budgets may be cut.



**Talking to you is the best part  
of our jobs.**

# Earth Science to Action: an overview

The strategy taps into ESD's end-to-end capability as an open enterprise to incorporate innovation, scientific discovery, and emerging user needs to accelerate the use of Earth science and inform the next iteration of programs, missions, and initiatives.

## objectives:

- Holistically observe, monitor, and understand the Earth system
- Deliver trusted information to drive Earth resilience activities



NASA  
earth

# Earth Science to Action Strategy



## Virtuous Cycle

- User needs inform next iteration of programs, missions and initiatives

## Public Understanding & Exchange

- Put more scientific understanding into public sphere
- Deliver applied science to users
- Participate in multi-way info exchange
- Use input to inform subsequent work

## Solutions & Societal Value

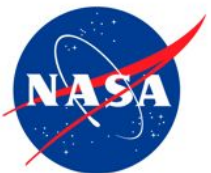
- Offer models, scientific findings and info through Open-Source Science principles
- Support climate services
- Provide science applications and tools to inform decisions

## Earth System Science & Applied Research

- Grow scientific understanding of Earth's systems
- Develop predictive modeling for science applications and tools to mitigate, adapt and respond to climate change

## Foundational Knowledge, Technology, Missions & Data

- Technology innovation
- Earth observations missions
- Data collected from space, air and ground



# NASA HQ Earth Science Division Leadership



**Karen St. Germain**  
DIVISION DIRECTOR



**Julie Robinson**  
DEPUTY DIRECTOR



**Sid Boukabara**  
*Senior Program Scientist, Strategy*



**Lawrence Friedl**  
*Senior Engagement Officer*



**Wendy Mihm**  
*Communications Lead*

## ELEMENTS



**Michael Seablom**  
*Associate Director*

**EARTH SCIENCE TECHNOLOGY OFFICE**

*Deputy Associate Director*  
**Vacant**



**Scott Schwinger**  
*Associate Director (Acting)*

**FLIGHT PROGRAMS**

*Deputy Associate Director*  
**Antonios Seas**



**Katie Baynes**  
*Earth Data Officer*

**EARTH SCIENCE DATA SYSTEMS**

*Deputy Earth Data Officer*  
**Vacant**



**Jack Kaye**  
*Associate Director*

**RESEARCH & ANALYSIS**

**David Considine**  
*Rotational Deputy*

*Deputy Associate Director*  
**Lucia Tsaoussi**



**Thomas Wagner**  
*Associate Director*

**EARTH ACTION**

*Deputy Associate Director*  
**Emily Sylak-Glassman**



## What is the Earth Action (EA) section?

- EA is a new section in ESD that is composed of all Applied Sciences programs/staff plus a half dozen new programs
- New PMs and PSs added to cover new programs
- Focus on synergies—eg commercial data, modeling outputs, etc.
- Increasing mission focus with PALs and activities for more missions
- Connecting across ESD; cross-cutting appointments and other approaches
- Potentially new funding opportunities
- **Amplified focus on meeting societal challenges and co-development, that are the hallmarks of Applied Sciences**
- **Motto: Scale, Build Bridges, User-centered**



# NASA earth ACTION



**Agriculture**



**Climate Resilience  
& Community Action**



**Capacity  
Building**



**Greenhouse  
Gas Center**



**Satellite Needs  
Working Group**

Empowering  
communities  
across the  
world to find  
solutions to  
the challenges  
they face  
every day.



**Disasters**



**Ecological  
Conservation**



**Energy and  
Infrastructure**



**Commercial  
SmallSat Data  
Acquisition**



**Earth  
Information  
Center**



**Health and  
Air Quality**



**Mission  
Engagement**



**Water  
Resources**



**Wildland Fires**



## Greenhouse Gas Center

Multi-agency effort to compile greenhouse gas data from observations and models into a collection of trusted greenhouse gas emissions and flux products.



## Earth Information Center

Provide actionable, easy-to-use data and information about earth's changing systems to the public.



## Satellite Needs Working Group

Partners with Federal agencies to identify high-priority sustained and unmet needs for satellite Earth observations.

# EARTH.GOV

<https://www.earthdata.nasa.gov/esds/impact/snwg/solutions>



## Commercial SmallSat Data Acquisition

Identify, evaluate, and acquire commercial small-satellite (SmallSat) data that support NASA's Earth science research & application goals.



# What do we need from you?

Your ideas, especially:

- Being the engine of innovation in remote sensing to meet societal challenges.
- Connecting w/ users to get needs into our thinking.
- Techniques for developing and sustaining partnerships.

Your concerns, with recognition that we are:

- Trying something new, it won't all go well.
- Expecting our current capabilities

**You have incredible experience doing this work already.**

Your patience and flexibility in:

- Taking a fresh look at how to achieve ES2A objectives.
- Understanding that we face fiscal headwinds.

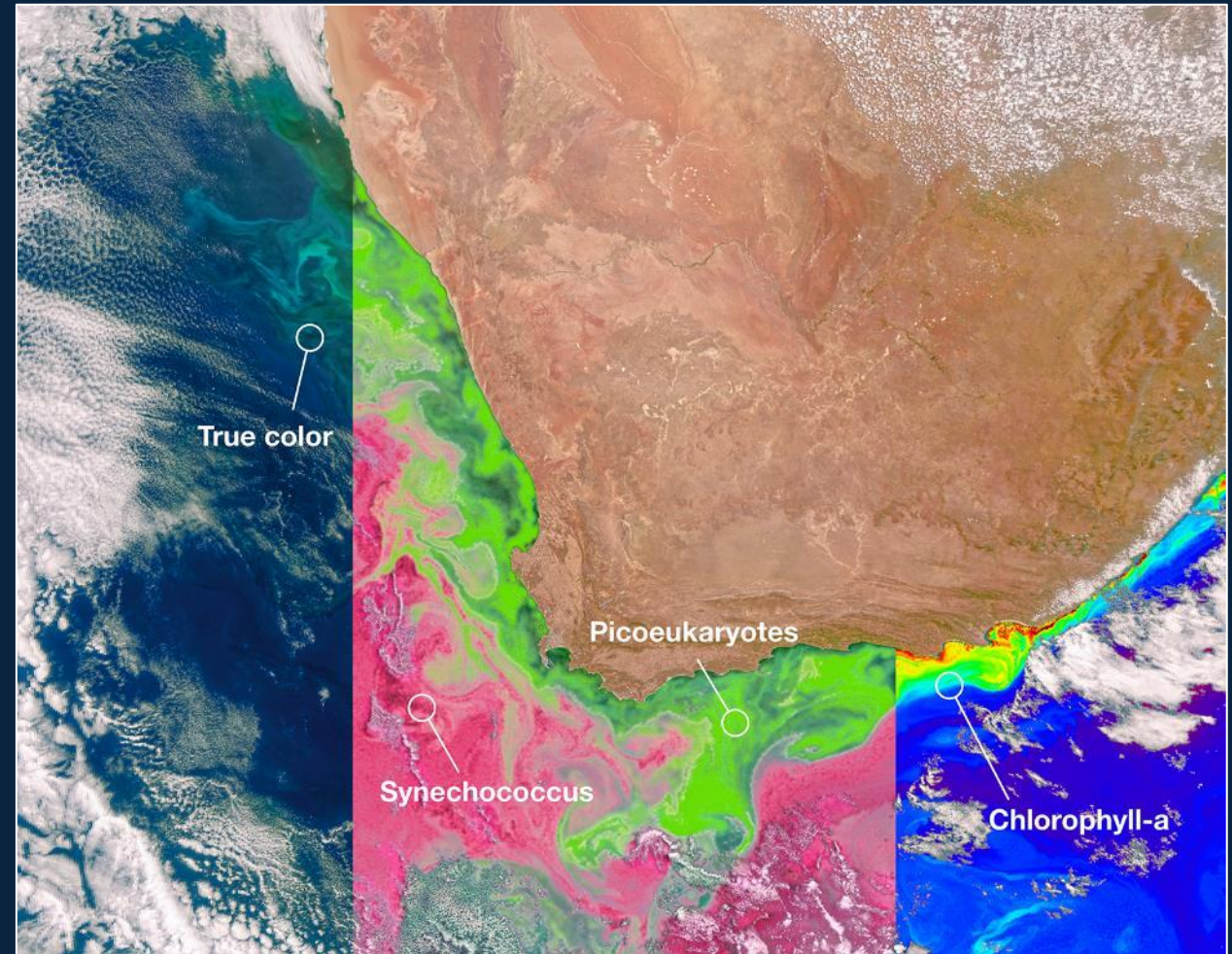
Recognize that we're one NASA; we all have to work together to address society's challenges.





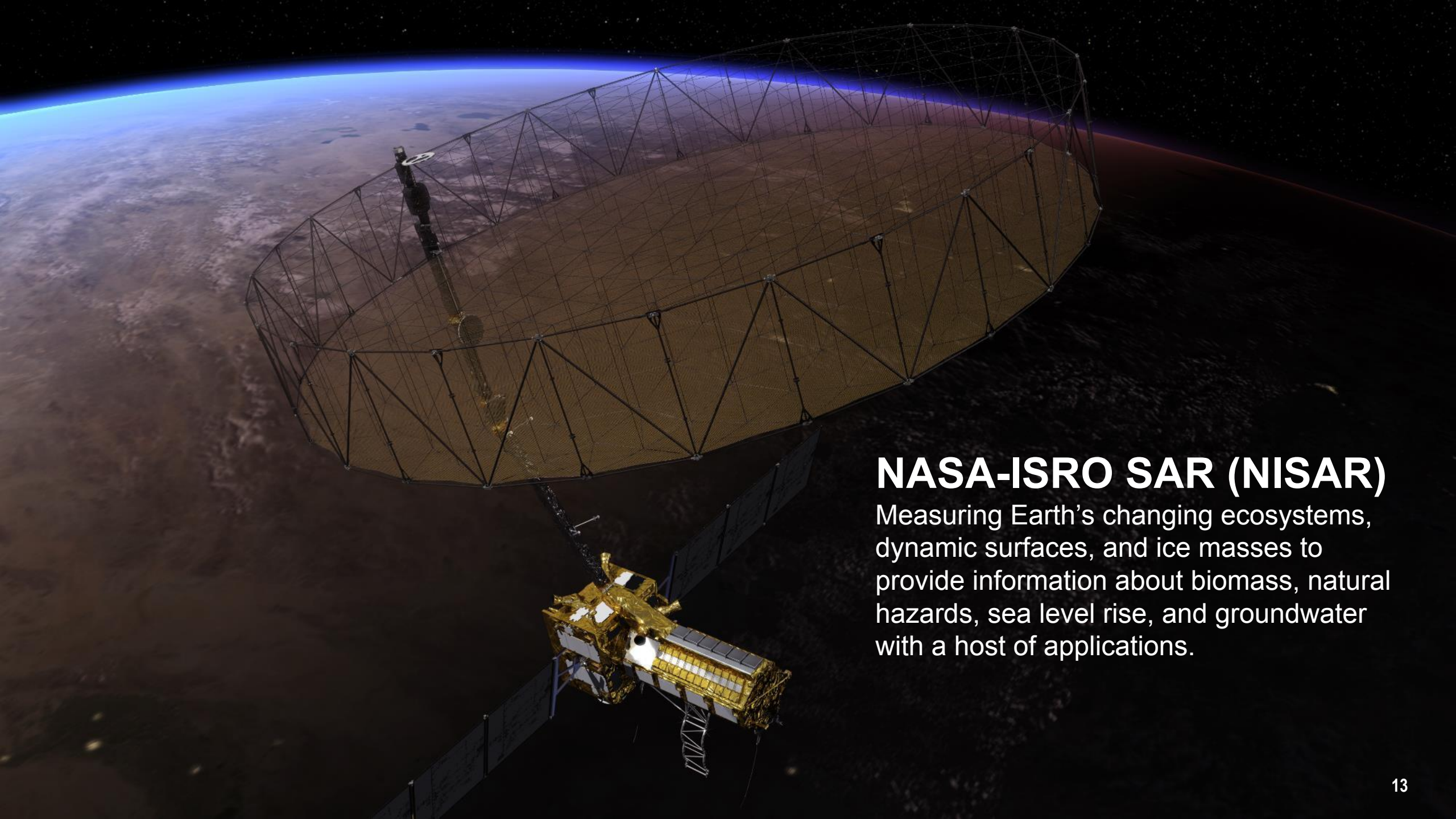
## PACE Advances Ocean Science

- Key ocean and atmosphere data for forecasting air quality and weather that will improve our understanding of Earth's climate
- **Monitor fisheries**
- **Respond to toxic algal blooms**
- **Improve tools like WhaleWatch**



PACE's Ocean Color Instrument (OCI) detects light across a hyperspectral range from the ultraviolet to near-infrared, which gives scientists new information to differentiate communities of phytoplankton – a unique ability of NASA's newest Earth-observing satellite. This first image released from OCI identifies two different communities of these microscopic marine organisms in the ocean off South Africa on Feb. 28, 2024.

## PIGMENTS IN TERRESTRIAL PLANTS!

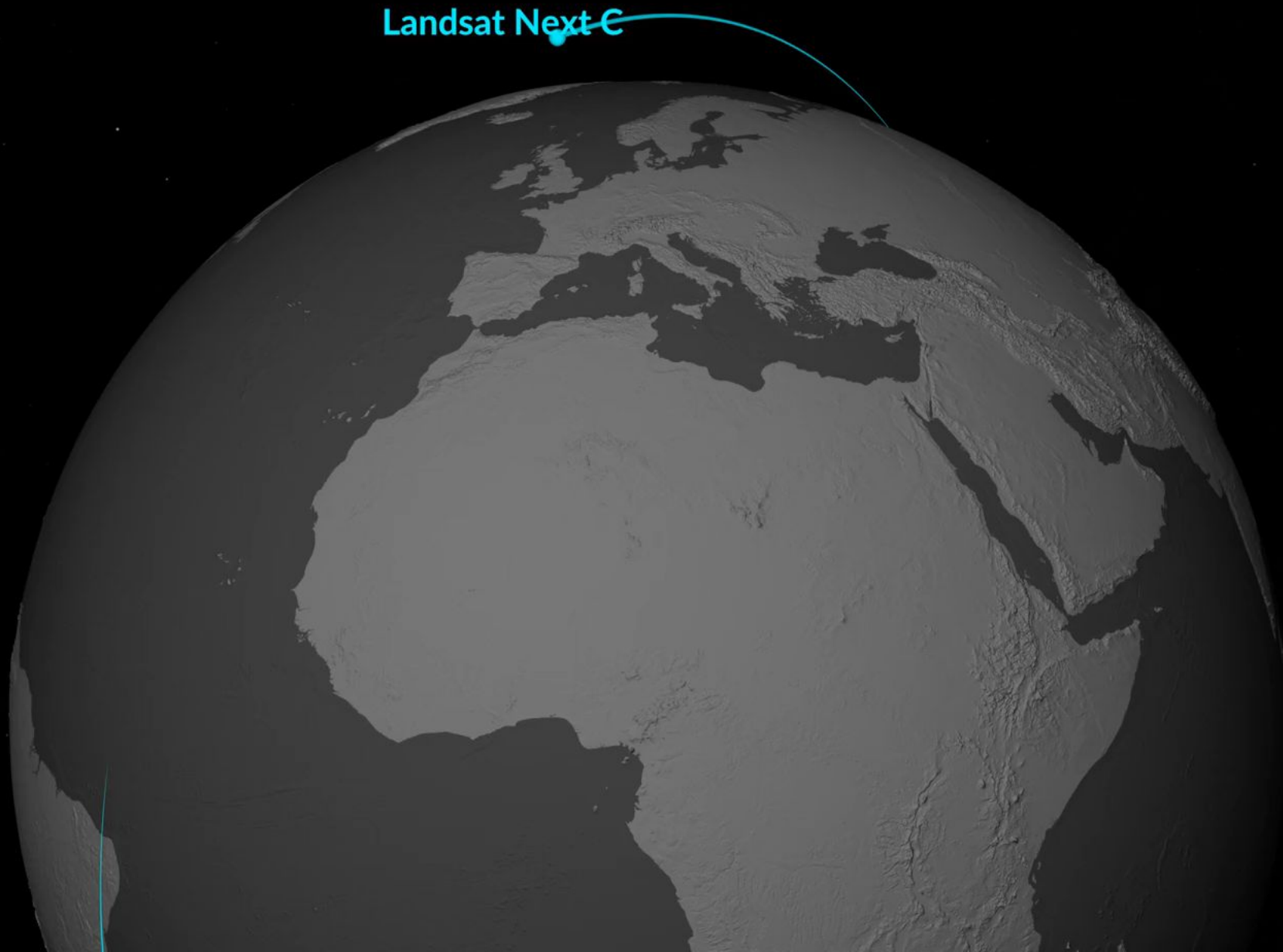


## **NASA-ISRO SAR (NISAR)**

Measuring Earth's changing ecosystems, dynamic surfaces, and ice masses to provide information about biomass, natural hazards, sea level rise, and groundwater with a host of applications.

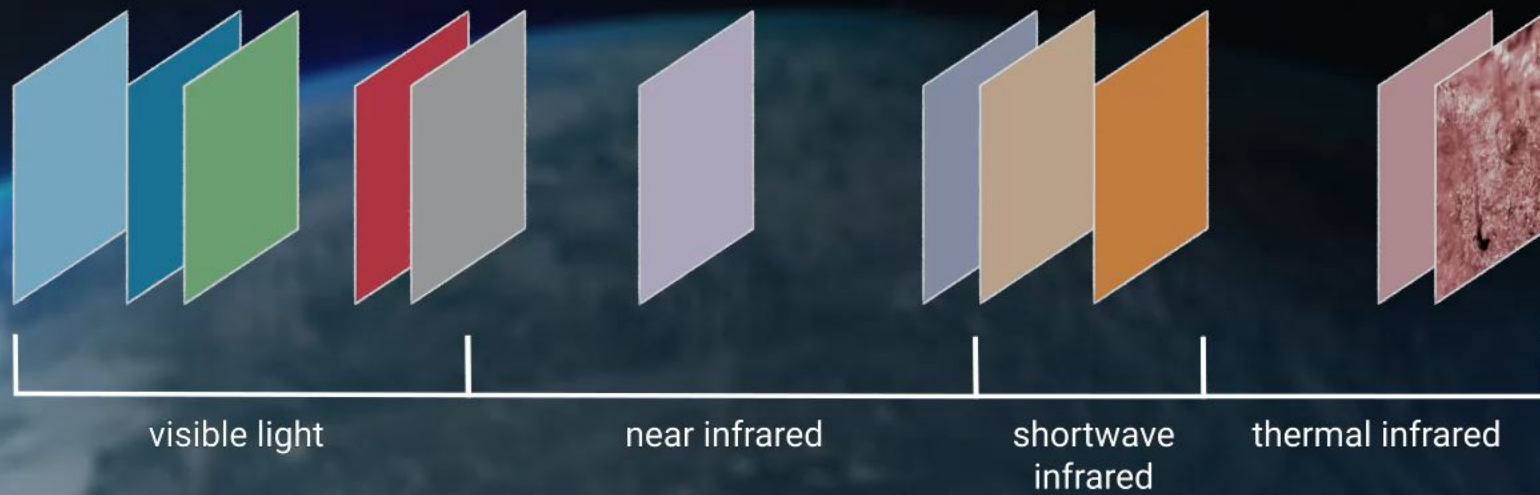
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Landsat Next-C



Designed by  
Agronomists!

## Landsat 8-9



# EARTH SYSTEM OBSERVATORY

INTERCONNECTED CORE MISSIONS

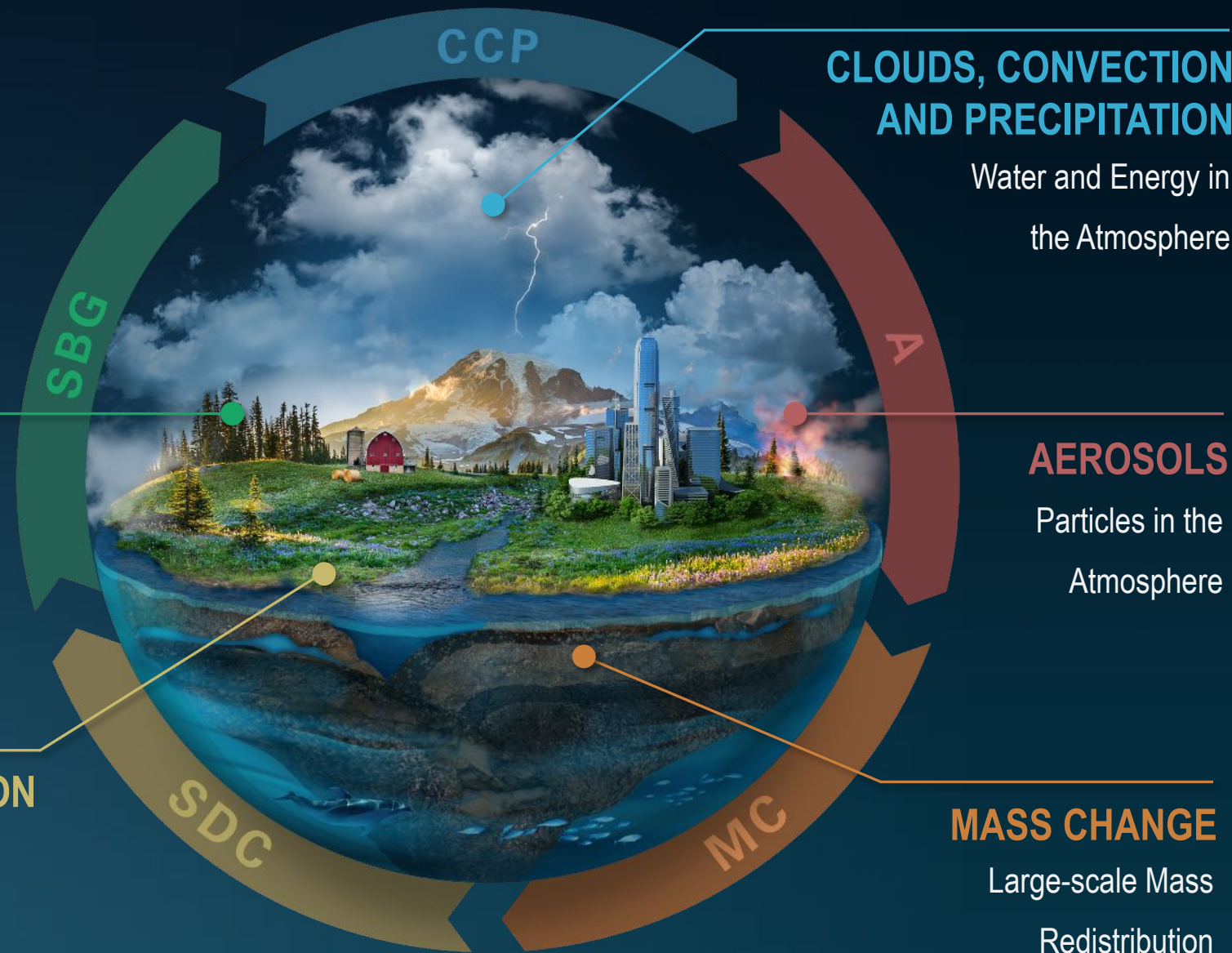
**SURFACE BIOLOGY AND GEOLOGY**  
Earth Surface & Ecosystems

SBG-TIR  
SBG-VSWIR

**SURFACE DEFORMATION AND CHANGE**

Earth Surface Dynamics

Met by **NISAR** launch in 2024



**CLOUDS, CONVECTION AND PRECIPITATION**

Water and Energy in the Atmosphere

**AEROSOLS**

Particles in the Atmosphere

**MASS CHANGE**

Large-scale Mass Redistribution

**GRACE-C**

**ATMOSPHERIC SCIENCE MISSIONS**

**PMM**  
Competed Mission  
Directed Mission  
Partner Missions

Observables now in Mission Formulation



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- Expecting and encouraging feedback.

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**Recognize that we're one NASA; we all have to work together to address society's challenges.**





**NASA**  
**earth**

[science.nasa.gov/earth](https://science.nasa.gov/earth)

Your Home. Our Mission.